

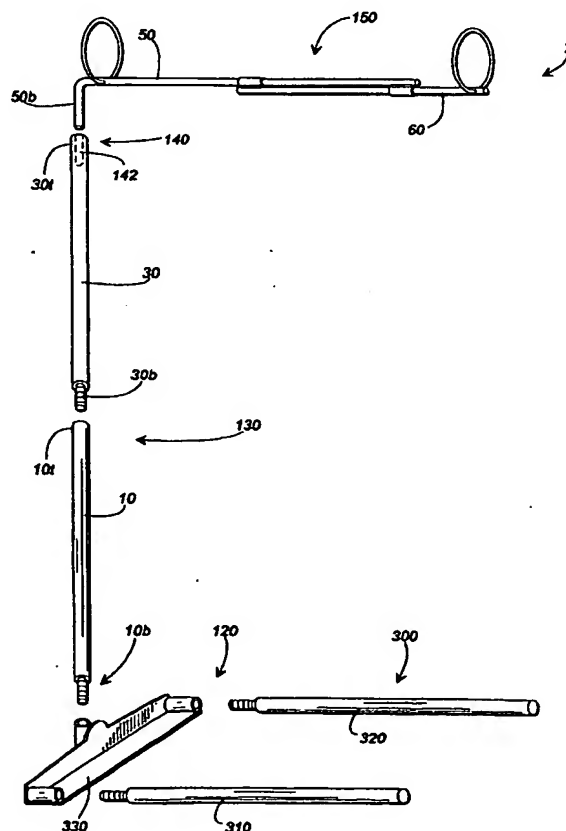


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(54) Title: ADJUSTABLE GAS SUPPLY SUPPORT**(57) Abstract**

A support apparatus for holding the tubing of a gas supply system (600) in an elevated position, which is readily adjustable and freely moveable and which is capable of safely delivering a gas to a sleeping individual without interfering with the individual's sleeping patterns.



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ADJUSTABLE GAS SUPPLY SUPPORT

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to an adjustable apparatus for supporting a flexible gas supply. The invention relates specifically to a support device for supporting the tubing of the gas supply of a respirator or respiratory-type device in an elevated position. This elevated configuration of the tubing enables an individual using the respiratory device to sleep without becoming entangled with the tubing of the device. The present invention is particularly useful for individuals suffering from sleep apnea. Preferably, the support device has a freely rotatable swing arm and both vertical and horizontal adjustment. Additionally, the present invention has a number of different mounting embodiments, such as a wall mount or a clamp for mounting the support to a headboard.

2. Description of Related Art

A variety of support devices for flexible members are known to exist. For example, U.S. Patent No. 1,673,704 to Palmer et al., "Electric Cord Support," discloses a device for slidably supporting the cord of an electric flat-iron so that the cord is held in an unobstructive position while the iron is used on an ironing board. An elevated arm extends generally the length of the ironing board, wherein one end of the arm is angled 90 degrees and bracketed to the ironing board. The cord rests in hooks on the arm support.

U.S. Patent No. 2,881,998 to Robbins, "Surgical Flexible Cable Support," discloses another flexible cable support, which, during a surgical procedure using a surgical instrument with a power supply, suspends the instrument's cable so that the surgeon is not burdened by the drag and weight of the flexible cable assembly while operating. The surgical cable supporting means includes a flange extension conduit to fit in place on the electric motor and a pivotal mounting means for cable supporting arms. A sliding ring is slidably attached to the cable-supporting arm while the other end of the cable supporting arm is under tension by a spring connecting the cable supporting arm and, ultimately, the flanged extension.

Several devices are known to incorporate support devices for flexible gas supply tubing, including U.S. Patent No. 2,963,247 to Collier et al., "Support For Anesthesia Applier," that discloses a support for the nozzle and hoses for an anesthesia administering device. A base plate supports an upstanding tubular rod member carried by a pivot. A second

rod is telescopically fitted into the tubular rod member. A socket at the end of the second rod releasably secures a generally horizontal rod member perpendicular to the second rod. The second rod assumes the angle of the tubular rod member in addition to the telescopic and rotational adjustment thereof, as locked by a setscrew. Once set, the screw is intended to prevent rotation of the second rod. Hose-engaging members extend the length of the horizontal rod and retain the hoses of the anesthesia-administering device.

U.S. Patent No. 3,464,411 to Martinez, "Respirator Holder Device," discloses a device for positioning the mouthpiece of a respirator relative to the mouth of a patient lying in the face-up position. The patient's head is positioned face-up on a support surface from which a rigid frame extends upwardly and in a generally u-shape. The rigid frame is pivotally mounted to the support surface. The rigid frame supports the weight of the respirator hose and nozzle through a resilient spring member and bracket.

U.S. Patent No. 4,377,161 to Whitt, "Surgical Breathing Apparatus," discloses an apparatus comprising a frame of hollow members having a lateral member connected to a surrounding or encircling perimeter member, with the perimeter member formed with a bridge portion in general conformity to the nose of the patient and projecting generally in a plane parallel to the surface of the face and torso of a patient on the operating table, with the hollow members being formed as an enclosed conduit having at least one inlet aperture for the admission of breathing gas and at least one outlet aperture in the bridge portion for the discharge of breathing gas; and a support member adjustably connected to the frame having clamping means to support the apparatus on the operating table.

U.S. Patent No. 4,593,688 to Payton, "Apparatus For The Delivery Of Oxygen Or The Like," discloses an applicator apparatus for a child which has been admitted for application of medication including a cooled saturated fog of nebulized water and oxygen mixture. It further discloses a delivery device comprising flexible delivery tube with slidable hangers which suspends a major portion of the hose from a rod hanging over a crib or bed.

U.S. Patent No. 5,014,693 to Wright, II et al., "Ceiling-Mounted Gas Delivering Unit For Use In A Catheter Laboratory," discloses an apparatus comprising a universally articulatable support arm, one end of which is adapted to mount into a ceiling and the other end of which is mounted to a gas module. The gas module is adapted to deliver gas received from a hose that connects the gas module to a source of gas. The hose generally extends along the support arm and is disposed outside the support arm.

These devices suffer common disadvantages overcome by the present invention. They are limited in their pivot action, cumbersome and difficult to install, and not adequately designed for sleeping patients requiring a gas supply through the night.

For those prior art devices intended to support flexible tubing, Collier et al. discloses a device which cannot adjust and swing with a patient's normal sleep restlessness. Martinez discloses a device that positions a mouthpiece of a respirator relative to the mouth of patient lying only in the face-up position, and similarly, cannot adjust with a patient's restlessness. Whitt discloses an apparatus to assist a patient's breathing on an operating table during surgical procedures, and not for home use. Lastly, Payton discloses an apparatus adapted to be supported on the head of a patient having a headpiece aiding in the treatment of croup or the like, which apparatus is not designed for easy mounting and use for a patient without a headpiece, requiring a gas supply while sleeping comfortably at night.

There is a tendency for the mask attached to the gas supply to be pulled off the individual's face when the individual moves around, in particular rolls over, during sleeping. Accordingly, none of these devices present an adjustable and freely moveable support for a gas supply which would allow an individual, such as one suffering from sleep apnea, to comfortably sleep with a face mask on connected to a gas supply.

Thus, it can be seen that there is a need for an adjustable gas supply support, and specifically for an easy-to-use and operate apparatus for supporting the tubing of a respirator or respiratory-type device in an elevated position which is readily adjustable and freely moveable. It is to the provision of such an apparatus that the present invention is primarily directed.

SUMMARY OF THE INVENTION

Briefly described, in a preferred form, the present invention overcomes the above-mentioned disadvantages, and substantially improves upon the prior art, by providing an adjustable gas supply support that can easily, safely and inexpensively maintain a gas supply in an elevated position to allow a person using the gas supply to sleep without becoming entangled with the flexible tubing of the gas supply. The present invention is designed to install simply by the patient/homeowner without the need of specialized tools or special expertise. The apparatus is easy and inexpensive to operate and maintain, and is durable through the many cycles of swinging caused by a patient's natural restlessness during sleep. The support apparatus is also freely moveable so as to prevent a facemask attached to the gas supply from being pulled off of one's face while moving about during sleep.

The present invention generally comprises a swing arm, a vertical support assembly, a pivot means connecting the swing arm to the vertical support and allowing the swing arm to freely pivot, and a mounting means to securely mount the present invention in proximity to both the gas supply and head of the user. In preferred form, the elements of the present invention are generally of lightweight construction, can easily be erected and adjusted manually without the need for any tools, and can be fitted upon a number of mounting supports by the patient/homeowner. The present device is designed specifically with the user in mind. The device is portable, and breaks down into its several elements wherein all the elements can fit within a small tote bag, for example. The device is designed to mount to any type of headboard or bedroom furniture, so the present invention can follow the user from a health care facility to home, and from home to vacation.

The swing arm of the present invention preferably comprises two or more substantially horizontal support members that are slidably engaged, thus allowing easy adjustment of the length of the swing arm. The swing arm can include a first horizontal support member and a second horizontal support member. In a preferred form, the first horizontal support member has a bend at the bottom end. The swing arm further comprises restraining elements to keep the flexible tubing in proximity to the swing arm. The restraining elements can be restraining rings that generally encircle and support the flexible gas supply against the swing arm.

The vertical support assembly of the present invention preferably comprises two or more substantially vertical support members, including a top vertical support member and a bottom vertical support member. The support members can be releasably fastened together by known techniques, including screw fastening or slidable engagement with one another, both allowing for the easy adjustment of the overall length of the vertical support. Thus, in a preferred embodiment, to adjust the vertical length of the present invention, one need only remove or add a support member. In another embodiment, the vertical support members slidably engage each other enabling, for example, telescopic adjustment. In this embodiment, the top end of the bottom vertical support telescopically encircles the bottom end of the top vertical support.

The swing arm is rotatably connected to the vertical support by the pivot means. The pivot means generally enables the swing arm to rotate freely in a generally horizontal plane. In a preferred embodiment of the present invention, the pivot means comprises a smooth bore cut within the top end of the top vertical member, wherein the bottom end of the first horizontal member slips within the bore. In another embodiment, the pivot means comprises a receiving

member including a rod support and a barrel-shaped receiving end having a longitudinal bore. The top vertical support slidably encircles the rod support, and the bottom end of the first horizontal support slips within the longitudinal bore of the receiving end.

5 The present invention mounts in proximity to both the gas supply and the user's head by the mounting means. The mounting means of the present invention has numerous alternative embodiments. The mounting means mounts the present invention to, for example, a bed's headboard, an end table located in proximity to a bed, the wall behind the headboard of the bed, and various other locations.

10 The present invention can further comprise a securing means to secure the adjustment positions (overall lengths) of both the swing arm and the vertical support. In one embodiment, the securing means is a thumb lock screw arrangement.

Accordingly, it is an object of the present invention to provide an adjustable apparatus for supporting a flexible gas supply.

15 It is another object of the present invention to provide an easy-to-use and operate apparatus for supporting the tubing of a respirator or respiratory-like device in an elevated position.

It is a further object of the present invention to provide a support for holding the tubing of a respirator or respiratory-like device in an elevated position to enable a person to sleep without becoming entangled with the tubing.

20 It is an additional object of the present invention to provide a support for holding tubing of a respirator or respiratory-like device in an elevated position comprising several embodiments for the easy mounting of said device.

It is yet another object of the present invention to provide an easy-to-install and easy-to-use device designed for sleeping patients requiring a gas supply through the night.

25 It is yet a further object of the present invention to provide such a support which is readily adjustable and freely moveable allowing an individual to comfortably sleep while wearing a gas face mask attached to a gas supply supported by the present invention and to move about during sleep while wearing such a mask without the mask being pulled off the individual's face

30 These and other objects, features, and advantages of the present invention will become more apparent upon reading the following specification in conjunction with the accompanying drawing figures.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an exploded view of an adjustable gas supply support according to a preferred embodiment of the present invention.

Fig. 2 is a perspective view of a preferred swing arm of the present invention.

5 Fig. 3 is a perspective view of the constructed adjustable gas supply support of Fig. 1.

Fig. 4 is a perspective view of an adjustable gas supply support according to another embodiment of the present invention.

Fig. 5 is an exploded view of another preferred embodiment of the present invention.

10 Fig. 6 is a perspective view of a swing arm of the present invention supporting an air hose.

Fig. 7 is an illustration of another embodiment of the vertical support of the present invention to accommodate a wide headboard.

Fig. 8 is a perspective view of another embodiment of the present invention mounted to a bed frame.

15 Fig. 9 is a perspective view of another embodiment of the present invention mounted to a headboard.

Fig. 10 is a perspective view of another embodiment of the present invention mounted between the mattress and box spring of a bed.

20 Fig. 11 is a perspective view of another embodiment of the present invention with swage tubing as the pivot means.

Fig. 12 is a perspective view of another embodiment of the mounting means, used in connection with the invention of Fig. 11.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now in detail to the drawing figures, wherein like reference numerals
25 represent like parts throughout the several views, Fig. 1 shows an exploded view of a preferred adjustable gas supply support apparatus 2 that can easily, safely and inexpensively support a gas supply in an elevated position enabling an individual using a respiratory device to sleep without becoming entangled with flexible tubing of the device and without the gas mask of the supply being pulled off of the individual's face. The present invention 2 generally
30 comprises a swing arm 150, a vertical support assembly 130, a pivot means 140 allowing the swing arm to freely pivot about the vertical support assembly 130, and a mounting means 120 to securely mount the present invention 2 in proximity to both the gas supply and head of the user.

In preferred form, the elements of the present invention are generally of lightweight and durable construction, for example, aluminum, can easily be adjusted manually without the need for specialized tools or significant strength, and can be releasably or fixedly attached in proximity to a patient's bed by the patient/homeowner without damage to existing construction or furniture, as described below in detail.

In reference to Figs. 1-3, in a preferred embodiment of the present invention 2, the swing arm 150 comprises two or more horizontal support members, each having front and back ends. In this preferred embodiment, the swing arm 150 comprises first horizontal support 50 and second horizontal support 60. The first horizontal support 50 has a bend of approximately 90 degrees at its back end 50b, and the second horizontal support 60 is slidably fixed to the first horizontal support 50. This allows for the easy length adjustment of the swing arm 150.

The directional term horizontal herein is merely relative of the horizontal direction. The support 2 of the present invention functions as a support apparatus for tubing. In order to provide the patient with an unobstructed gas flow through the tubing, which tubing remains in proximity to the patient's mouth even through restless sleep, the support 2 must guide the tubing from the respirator, over any obstructions like a bed's headboard, and finally to the patient. Therefore, the swing arm 150 need not be perpendicular to the vertical support assembly 130 to provide this path to the tubing. Neither must the swing arm 150 or vertical support assembly 130 be in exact horizontal or vertical orientations. Yet, for simplicity, and as preferred embodiments, the descriptions and figures herein depict a substantially horizontal swing arm 150 and a substantially vertical assembly 130 that are substantially perpendicular. It will be understood by one skilled in the art that the free rotation of the swing arm 150, the simplicity of construction, and the spirit and objects of the present invention 2 can be achieved with a swing arm 150 and vertical support assembly 130 off of strictly horizontal and vertical, respectively.

Tubes 82, 86 fixedly attached to first and second horizontal supports 50, 60, respectively, and provide the preferable horizontal adjustment. Tubes 82, 86 have an inner diameter slightly greater than the outer diameter of first and second horizontal supports 50, 60, which enables supports 50, 60 to slidably adjust in respect to one another through the tubes 82, 86. Preferably, tubes 82, 86 are welded to the supports 50, 60 at each support's front end 50f, 60f.

The swing arm 150 further comprises restraining elements to keep the flexible tube in proximity to the horizontal supports 50, 60. These elements can be, for example, restraining rings 70 that generally encircle and support the flexible gas supply in proximity to the swing arm 150. Preferably, at least two retaining rings 70 are located one each on the first and second horizontal supports 50, 60. As shown best in Fig. 2, rings 70 preferably are rotatably fixed through supports 50, 60. It will be understood by one skilled in the art that other suitable means to support a gas supply to the present invention 2 may be used.

As shown in Figs. 1 and 3, the vertical support assembly 130 preferably comprises two or more vertical support members. In a preferred embodiment, the vertical support assembly 130 comprises top vertical support 30 and bottom vertical support 10. As shown in Fig. 1, the bottom end 30b of the top vertical support 30 preferably screws into the top end 10t of the bottom vertical support 10. Thus, in this preferred embodiment, the length of the vertical support assembly 130 is adjusted by adding or removing vertical supports. Fig. 1 illustrates the device 2 having two vertical supports, while Fig. 3 illustrates the device 2 having three vertical supports.

The pivot means 140 of the present invention 2 generally enables the swing arm 150 to swing freely in a constant horizontal plane, shown by the arrows of swing A and B in Fig. 3. In a preferred embodiment of the present invention 2, the pivot means 140 comprises a smooth bore 142 cut within the top end 30t of the top vertical member 30. The diameter of at least the back end 50b of the first horizontal support 50 is less than the diameter of the bore 142. Thus, the back end 50b of the first horizontal member 50 can slip within the bore 142.

To ensure the durability of pivot means 140, and to provide a consistently smooth swing arm 150 rotation through the patient's sleep, the difference between the diameters of the bore 142 and bottom end 50b is slight. That is, the tolerance is small enough to provide the bottom end 50b of first horizontal member 50 with substantially the same vertical orientation of top vertical support 30. Also, the depth of bore 142 is less than the length of bottom end 50b (the length of first horizontal support 50 substantially parallel to the top vertical support 30). Therefore, with the combination of the small tolerance, the fact that the bottom face of the bottom end 50b rests parallel with and atop the bottom face of the bore 142, and with the bend portion of first horizontal support 50 clear of the opening of bore 142, the swing arm 150 is provided with snag-free, smooth rotation.

As shown in Figs. 4 and 5, in another embodiment of the present invention 2, the swing arm 150 can also incorporate a securing means 66 which secures the adjustment position of the length of swing arm 150. The securing means 66 shown in Figs. 1 and 2 is a thumb lock screw 62 through the wall of tube 82, which clamps against the second horizontal support 60.

5 The present invention 2 can further comprise a vertical adjustment means 132 preferably enabling telescopic adjustment of the vertical support assembly 130. As shown in Figs. 4 and 5, bottom vertical support 10 has an inner diameter slightly greater than the outer diameter of top vertical support 30. The vertical support assembly 130 can also incorporate securing means 134 that secures the adjustment position of the vertical support assembly 130
10 of the embodiments of Figs. 4 and 5. The securing means 134 can also comprise a thumb lock screw 62 through the wall of the top end 10t of bottom vertical support 10, which upon adjustment, clamps against top vertical support 30.

In another embodiment of the present invention 2, the pivot means 140 can comprise a receiving member 42 having a rod support 40, and a barrel-shaped receiving end 46 having a
15 longitudinal bore 44.

Fig. 6 shows the swing arm 150 supporting gas hose (tubing) 600. As shown, restraining elements 70 are restraining rings, one each through the first and second horizontal supports 50, 60.

In another embodiment of the vertical support assembly 130, Fig. 7 shows vertical
20 support assembly 130 comprising extender support 36, top vertical support 30, and bottom vertical support 10. Extender vertical support 36 further extends the overall vertical length of vertical support assembly 130 while having a horizontal section that, for example, can accommodate a wide headboard. As shown, first horizontal support 50 rotatably attaches to the top end 36t of top vertical support 36. Figure 7 additionally illustrates the screw
25 connections of Figs. 1 and 3. Threaded portions releasably secure extender and vertical supports 36, 30 and 10 to one another. For example, the bottom ends 36b, 30b of supports 36 and 30 terminate into screw portions. The screw portions rotate in oppositely threaded bores in the top ends 30t, 10t of supports 30, 10. In this embodiment, adjusting the vertical length of vertical support assembly 130 would entail using either different length supports 36, 30 and
30 10, or a different number of supports thus eliminating the thumb lock screws 62 shown in Figs. 4 and 5.

Fig. 11 illustrates another embodiment of the present invention 2. The invention of Fig. 11 comprises a pivot means 140 including swage tubing 48 disposed between top vertical support 30 and bottom vertical support 10. The swing arm 150 and the vertical support assembly 130 here share a common support. In this configuration, top vertical support 30 and first horizontal support 50 are one integral member with an approximately 90-degree bend. Thus, horizontal adjustment of the swing arm 150 occurs at swage tubing 48.

In the embodiment of Fig. 7, the swing arm 150 comprises horizontal support 500 and the first and second horizontal supports 50 and 60 of a preferred embodiment. The horizontal support 500 extends the supports 50 and 60 away from vertical support assembly 130. The receiving end 52 of the first horizontal support 50 slips within the longitudinal bore 44 of the pivotal member 140. In this embodiment, the vertical support comprises only one vertical support 510. Additionally, there is no adjustment means for horizontal support 500 and vertical support 510, and therefore, no securing means 134. As shown, the pivot means 140 can comprise a barrel-shaped receiving end 46 having a longitudinal bore 44. In this embodiment, the pivot means 140 is fixedly secured to the distal end 500t of horizontal support 500.

The mounting means 120 of the present invention 2 can take numerous forms. The mounting means 120 generally mounts the present invention 2 to, for example, a bed frame 200 shown in Fig. 8, to a bed's headboard 210 shown in Fig. 9, between a mattress 220 and box spring 230 shown in Fig. 10, and various other possibilities. The mounting means 120 generally comprises a member for receiving the bottom vertical support 10 a suitable mechanism to mount the present invention 2 to a suitable surface.

As shown in Figs. 1, 3 and 10, the mounting means 120 can comprise assembly 300 having rods 310 and 320 laying in the horizontal plane generally parallel to swing arm 150, and bracket 330 fixedly attaching the rods 310 and 320 to the bottom end 10b of bottom vertical support 10. Bracket 330 may simply comprise a rod 330. Assembly 300 slips between a mattress 220 and box spring 230, and securedly mounts the present invention therebetween. The assembly and support of Figs. 1, 3 and 10 may be readily knocked down and taken apart to provide for easy packing for travel away from home.

Assembly 300 can further comprise locking member 340 disposed along vertical support assembly 130 used with beds without headboards, which locking member 340 can be adjusted to ride on the tope of the mattress 220, thus clamping the support 2 to the mattress 220 by rods 310, 320 under the mattress 220, and locking member 340 on top of the mattress

220.

As shown in Figs. 4 and 5, mounting means 120 can fixedly attach the support 2 to the back of a headboard by screws or Velcro®-like material. Fig. 5 shows the present invention 2 with mounting means 120 in a location suitable for releasably securing the support 2 to the back of a headboard by Velcro®. As shown, mounting means 120 comprises mount 125 having a front and back side 125f and 125b, and holes therethrough. The holes in mount 125 line up with holes in the vertical support, wherein pop rivets, screws and the like attach the mount 125 to the vertical support. Adhesive material like glue, tape or Velcro® can be attached to the front side 125f of mount 125 so the mount secures the present device 2 to a suitable surface.

Fig. 8 is another embodiment of the present invention 2, wherein mounting means 120 comprises holes 202, 204 through which screws of bed frame 200 may pass and secure the present invention 2 to the bed frame 200.

Fig. 9 shows another embodiment of the present invention 2, wherein mounting means 120 comprises a headboard clamp 250. Headboard clamp 250 comprises a first clamp member 252, a second clamp member 254 and screw 258. Screw 258 rotationally adjusts through second clamp member 254 through hole 256. Screw 258 adjusts, for example, a ball bearing with rubber protective coating 260 until ball bearing 260 comes in contact with headboard 210.

The mounting means 120 of Figs. 11 and 12 comprises a Velcro®-type wrap 135 around a portion of bottom vertical support 10. The wrap 135 can be adjusted to wrap around the bottom vertical support 10 at any location of bottom vertical support 10. Vertical adjustment of the invention works in combination with wrap 135 and the mounting means 120 of Fig. 12.

The mounting means 120 of Fig. 12 provides a bracket 120 having flat sections 123 and curved section 124. Curved section 124 is shaped to receive bottom vertical support 10 with wrap 135. Wrap 135 releasably connects to bracket 120 by the Velcro® strip 122 of curved section 124. The flat sections 123 may themselves connect to a headboard or the like by, for example, Velcro® attachment or screws.

While the invention has been disclosed in preferred forms, it will be apparent to those skilled in the art that many modifications, additions, and deletions can be made therein without departing from the spirit and scope of the invention as set forth in the following claims.

What is Claimed is:

1. An adjustable apparatus for supporting a flexible gas supply comprising:
 - (a) a swing arm;
 - (b) a vertical support assembly;
 - 5 (c) a pivot means, said pivot means coupling said swing arm to said vertical support assembly and enabling said swing arm to swing freely;
 - (d) a mounting member to mount the apparatus in proximity to the gas supply.
- 10 2. The apparatus of Claim 1, wherein said swing arm comprises a first and a second horizontal support member, each having a front and a back end.
3. The apparatus of Claim 2, wherein said vertical support assembly comprises a top and a bottom vertical support, each having a top and bottom end.
- 15 4. The apparatus of Claim 3, wherein said first and second horizontal support members are slidably engaged with each other, said top and bottom vertical supports are screw fastened to each other, and said pivot means comprises a smooth bore cut within the top end of the top vertical member, wherein the bottom end of said first horizontal support member slips within the bore providing pivotal rotation.
- 20 5. The apparatus of Claim 4, wherein said mounting means comprises a bracket attached to the bottom end of said bottom vertical member and a rod extending from each end of said bracket.
6. The apparatus of Claim 5, wherein said swing arm further comprises restraining elements attached to said first and second horizontal support members, said restraining elements supporting the gas supply in proximity to said swing arm.
- 25 7. An adjustable apparatus for supporting a flexible gas supply comprising:
 - (a) a swing arm having a first and a second horizontal support member, each including a front and a back end, said first and second horizontal support members being slidably engaged with each other, and said swing arm further having restraining elements attached to said first and second horizontal support members, said restraining elements supporting the gas supply in proximity to said swing arm;
 - 30 (b) a vertical support assembly having a top and a bottom vertical support, each including a top and bottom end, and said top and bottom vertical supports being screw fastened to each other;

(c) a pivot means, said pivot means coupling said swing arm to said vertical support assembly, and said pivot means including a smooth bore cut within the top end of said top vertical member, wherein the bottom end of said first horizontal support member slips within the bore providing pivotal rotation;

5 (d) a mounting member to mount the apparatus in proximity to the gas supply, said mounting means including a bracket attached to the bottom end of said bottom vertical member and a rod extending from each end of said bracket.

8. The apparatus of Claim 7, wherein said pivot means comprises a smooth bore cut within the top end of said top vertical member and a receiving member having a rod support and a barrel-shaped receiving end including a longitudinal bore, wherein said rod support of said receiving end slips within said bore in said top vertical member, and said bottom end of said first horizontal support member slips within said longitudinal bore of said receiving end.

10 8. The apparatus of Claim 7, wherein said swing arm further comprises securing means to secure the length of said swing arm against adjustment.

10. The apparatus of Claim 7, wherein said vertical support assembly comprises a top and a bottom vertical support, wherein said bottom vertical support has an inner diameter slightly greater than the outer diameter of said top vertical support which enables telescopic adjustment of the length of said vertical support assembly.

20 11. The apparatus of Claim 10, wherein said vertical support assembly further comprises securing means to secure the length of said vertical support assembly against adjustment.

12. An adjustable apparatus for supporting a flexible gas supply comprising:

25 (a) a swing arm having a first and a second horizontal support member, each including a front and a back end, said first and second horizontal support members being slidably engaged with each other, said swing arm further having restraining elements attached to said first and second horizontal support members, said restraining elements supporting the gas supply in proximity to said swing arm, and said swing arm further having securing means to secure the length of said swing arm against adjustment;

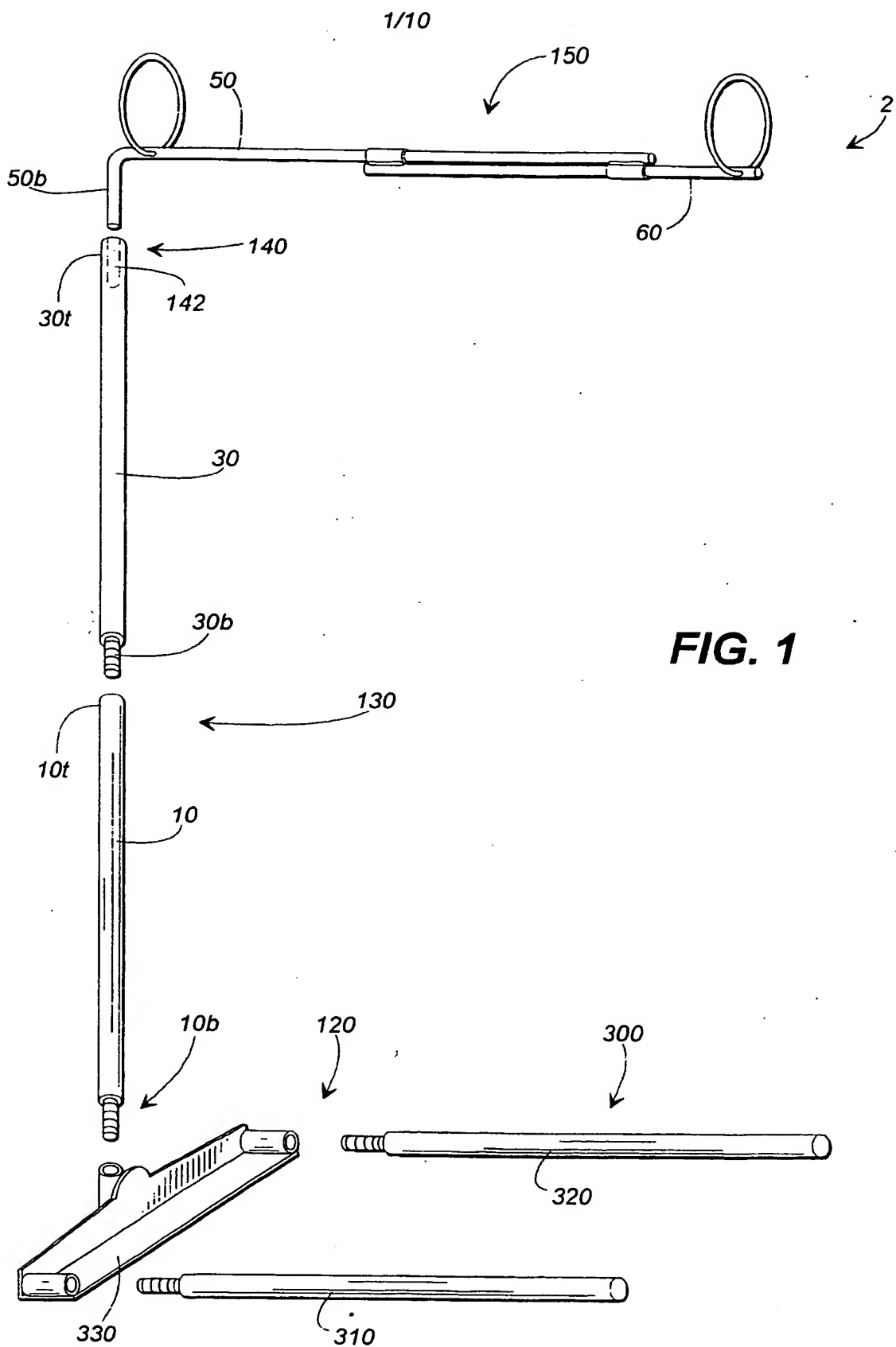
30 (b) a vertical support assembly having a top and a bottom vertical support, each including a top and bottom end, wherein said bottom vertical support has an inner diameter slightly greater than the outer diameter of said top vertical support which enables telescopic adjustment of the length of said vertical support assembly, said vertical support

assembly further having securing means to secure the length of said vertical support assembly against adjustment;

5 (c) a pivot means, said pivot means coupling said swing arm to said vertical support assembly, and said pivot means including a smooth bore cut within the top end of the top vertical member, wherein the bottom end of said first horizontal support member slips within the bore providing pivotal rotation;

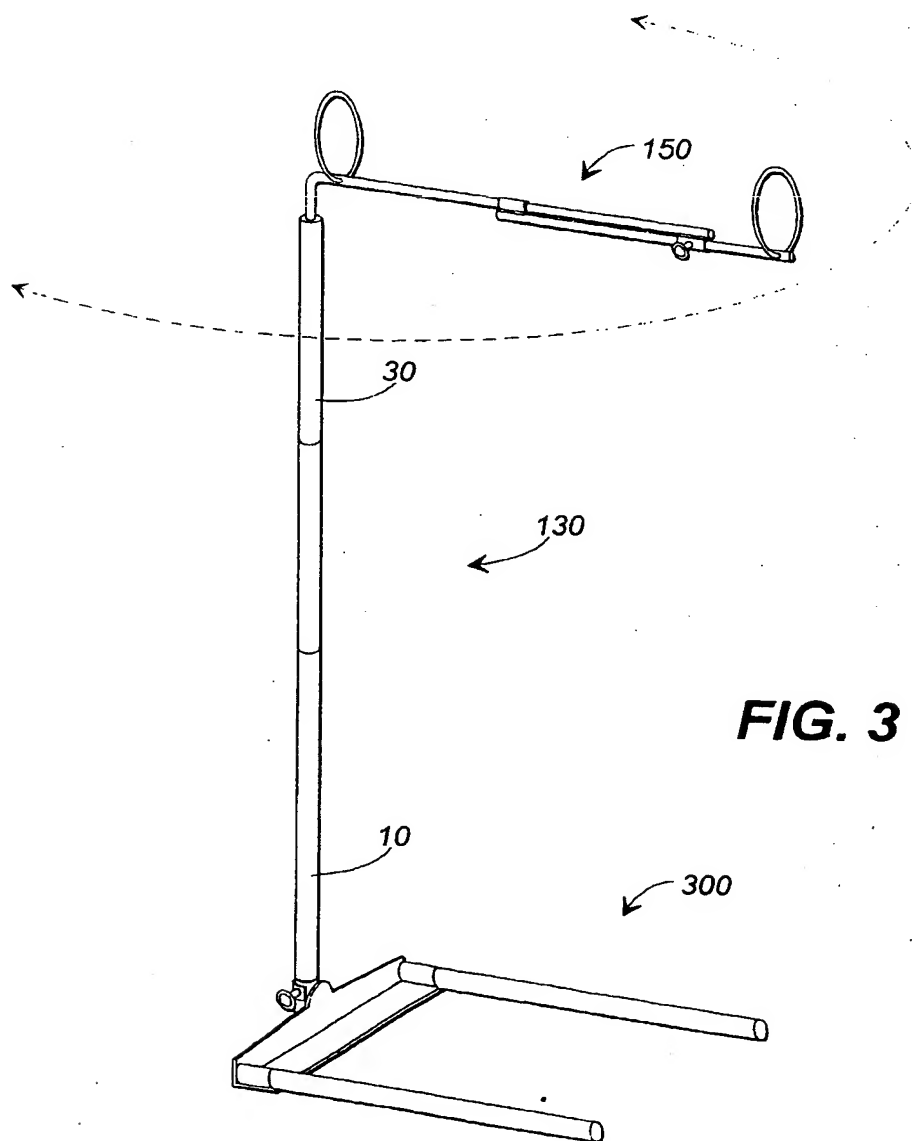
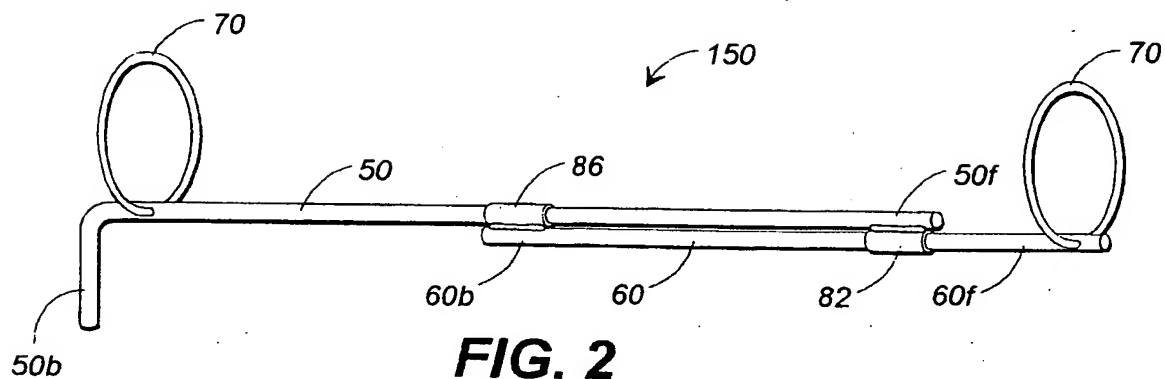
(d) a mounting member to mount the apparatus in proximity to the gas supply, said mounting means including a bracket attached to the bottom end of said bottom vertical member and a rod extending from each end of said bracket.

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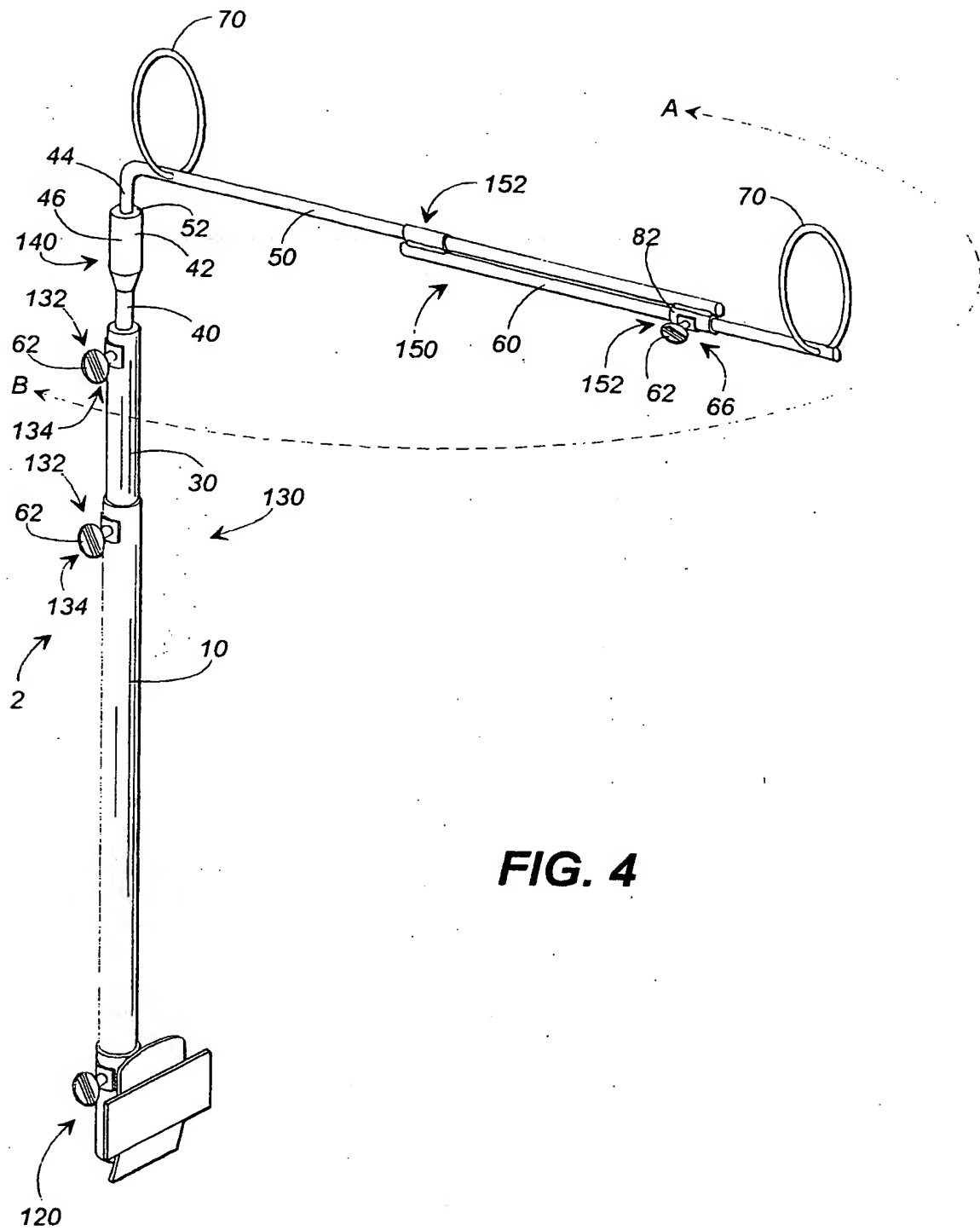
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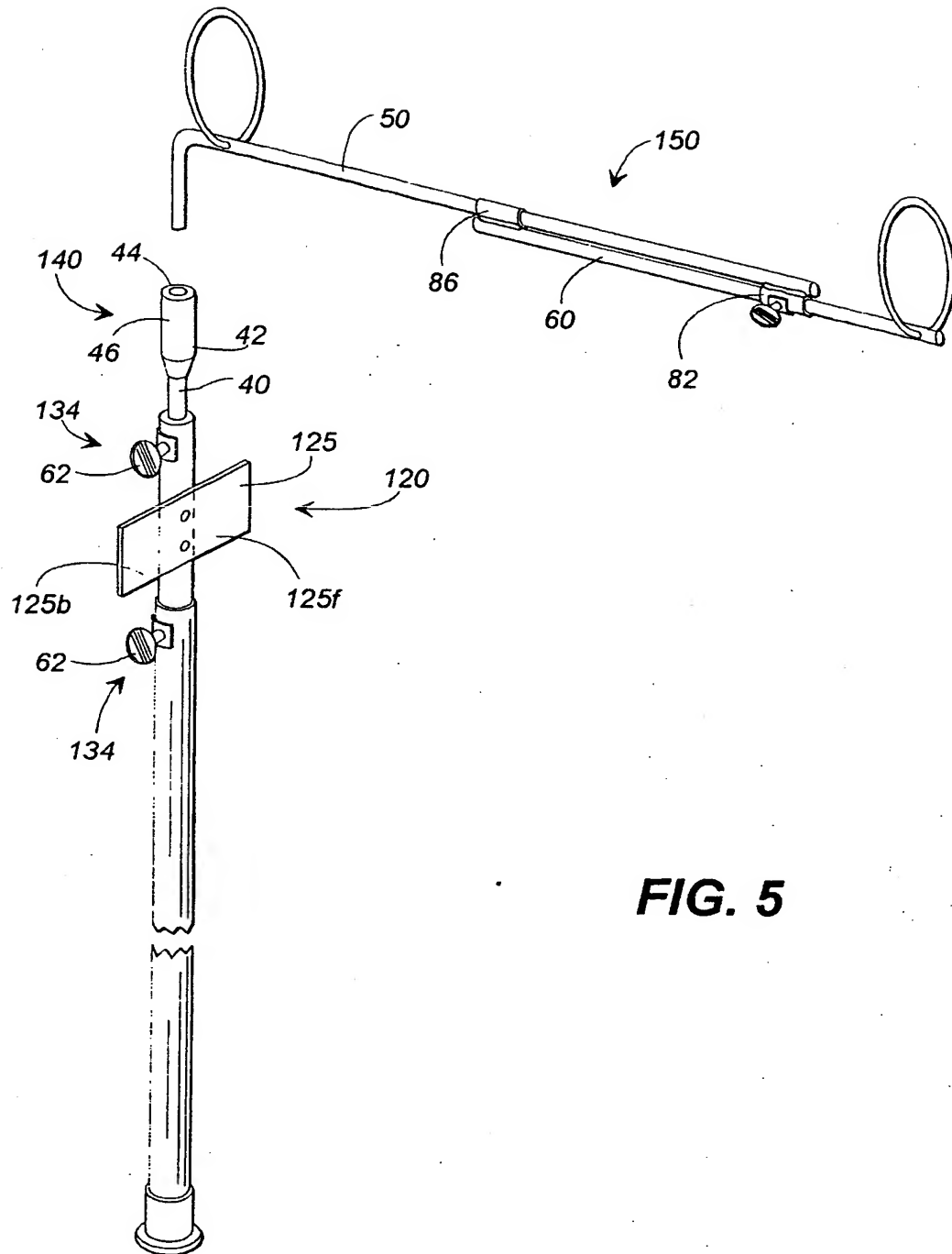
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**FIG. 4**

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**FIG. 5**

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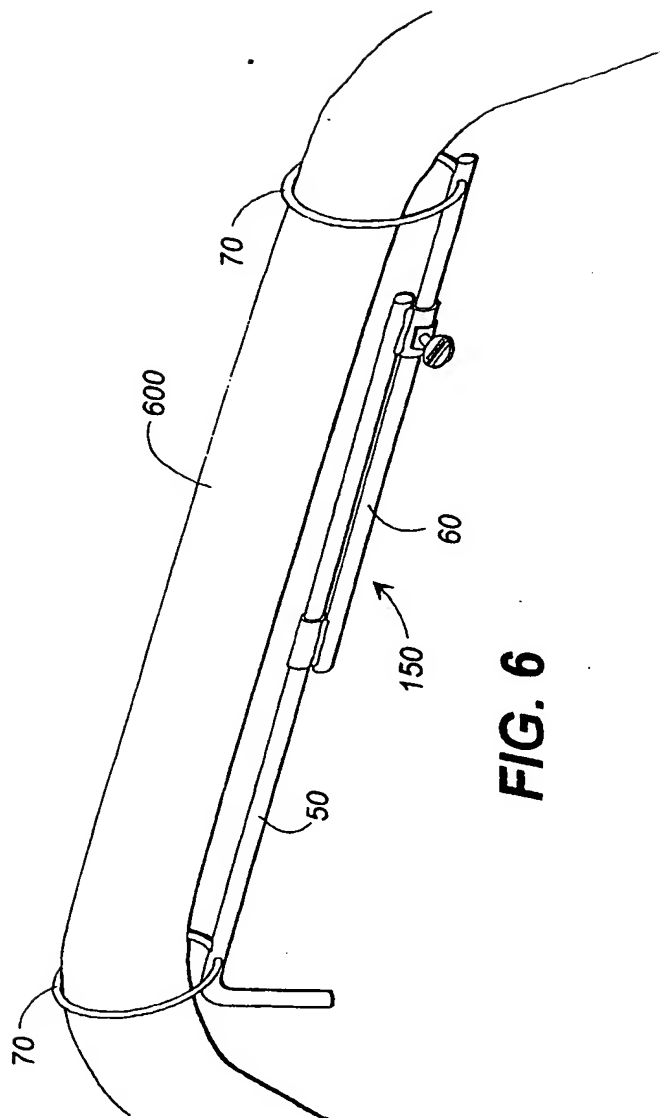


FIG. 6

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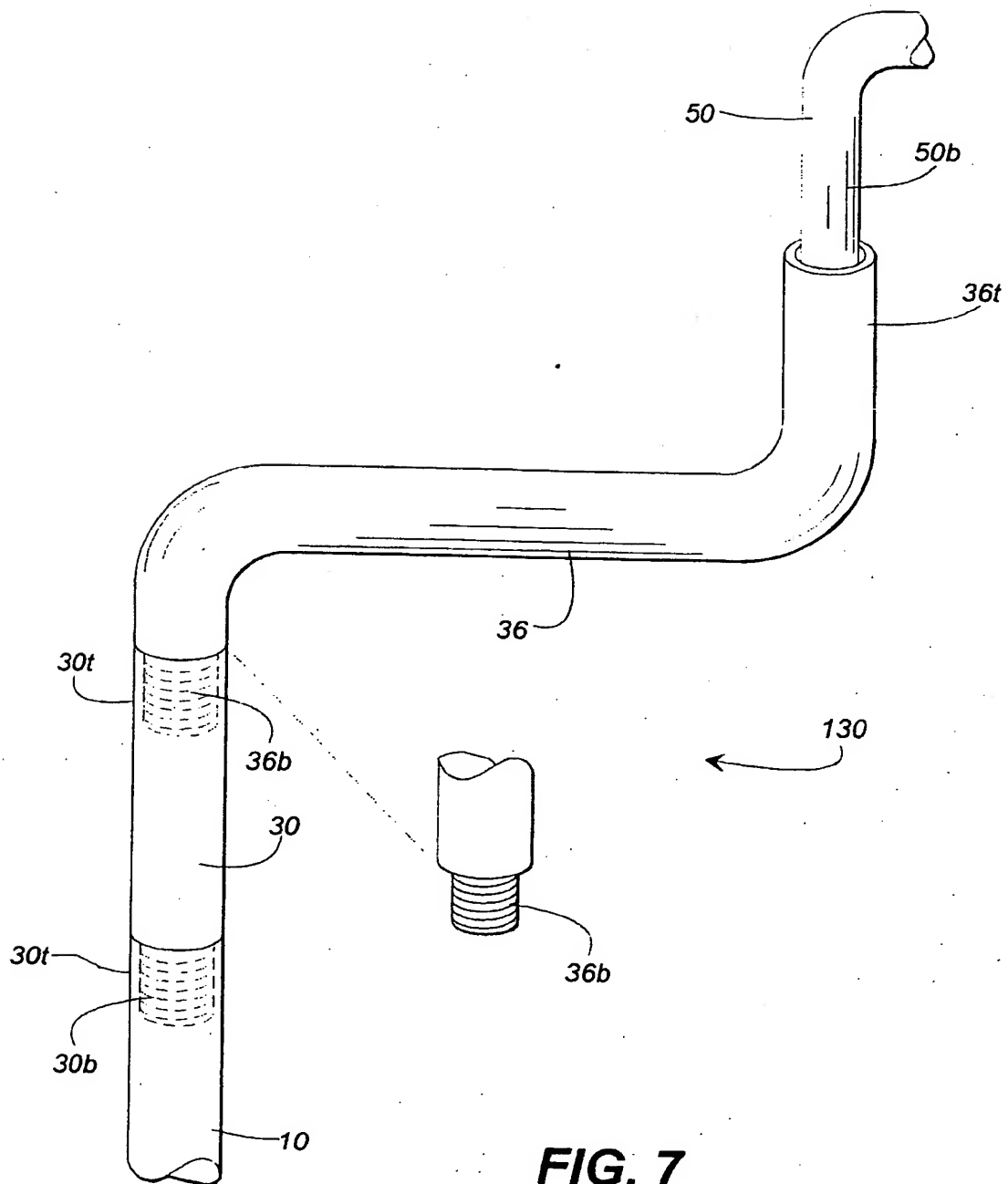
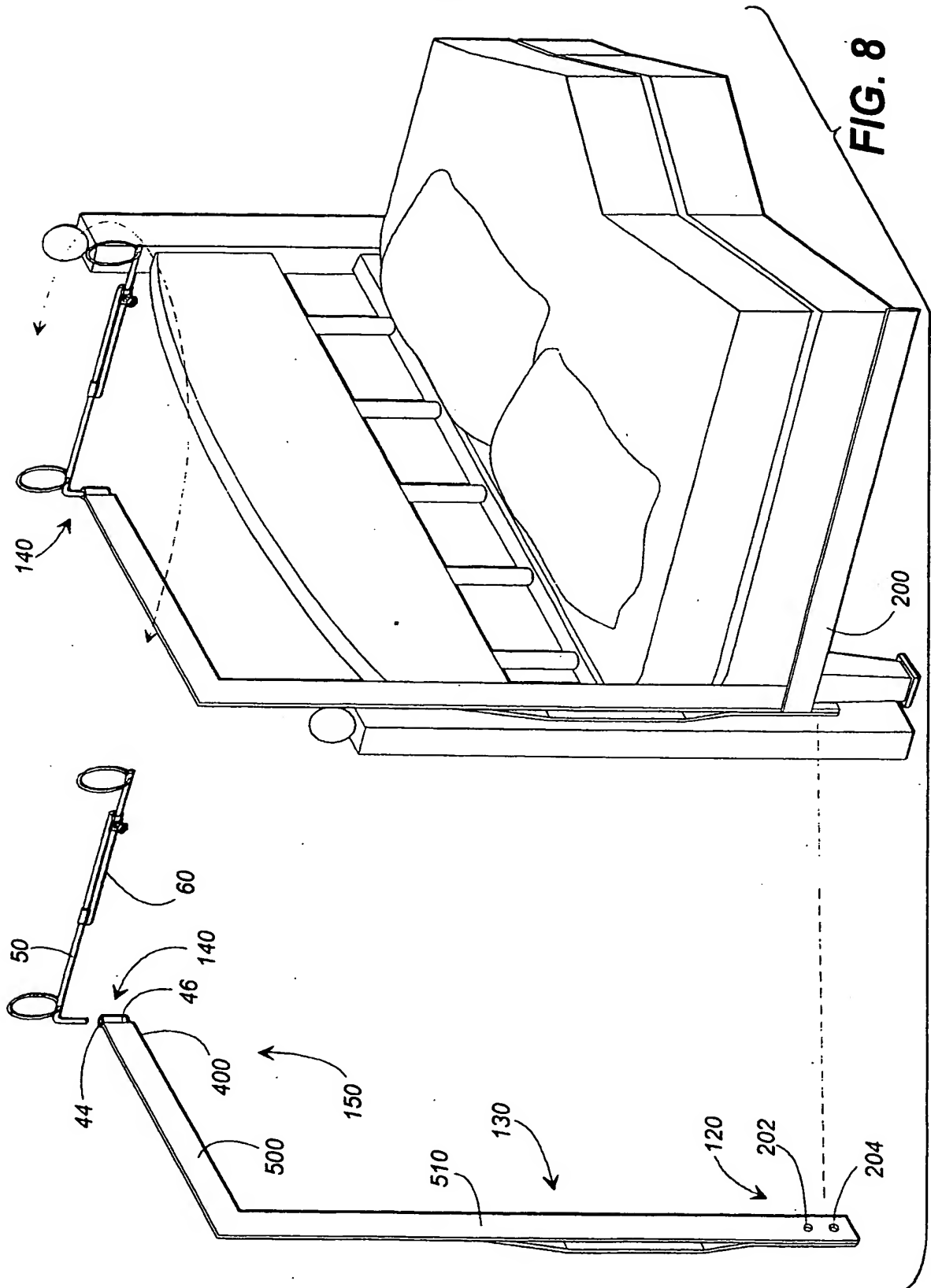
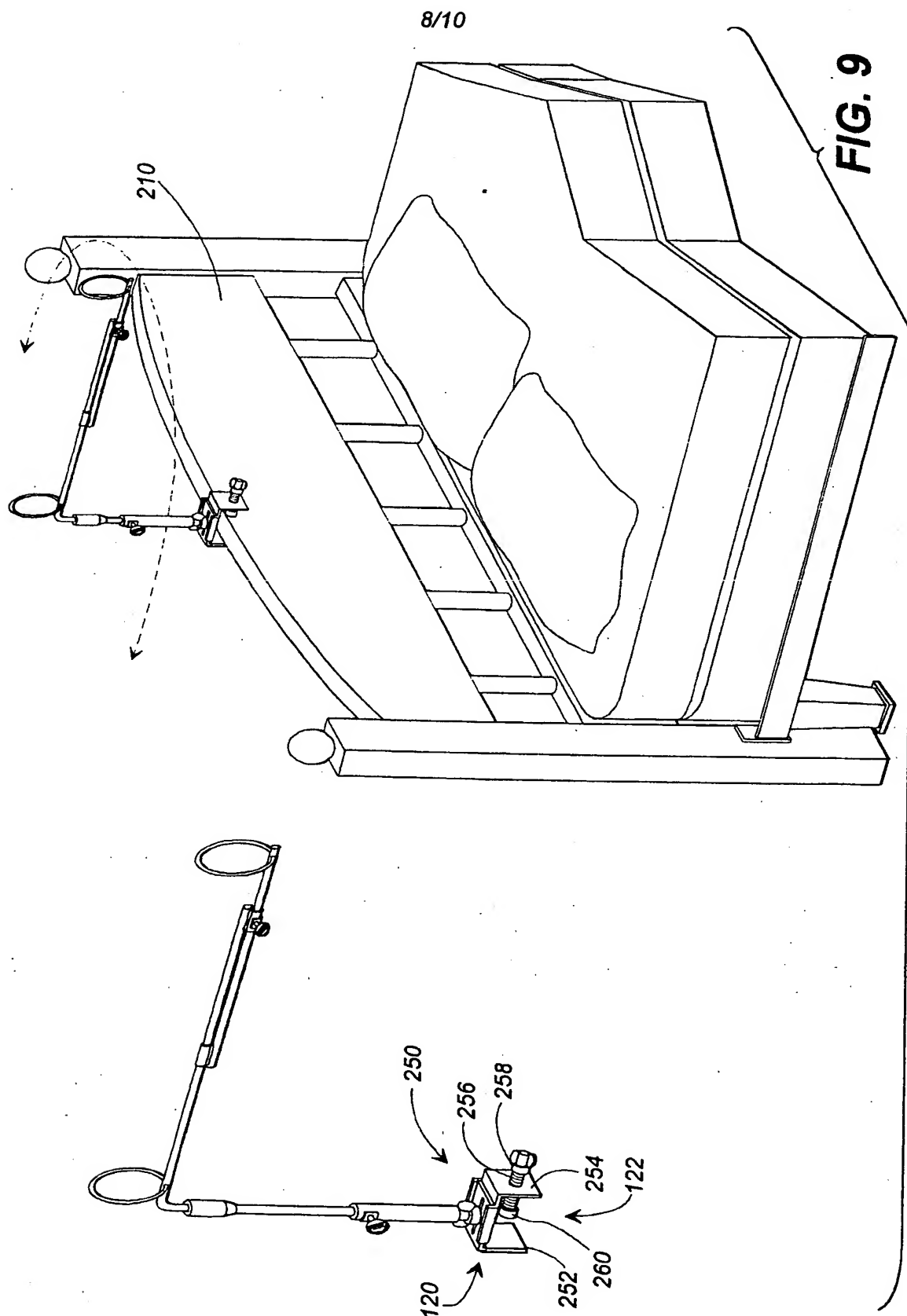


FIG. 7

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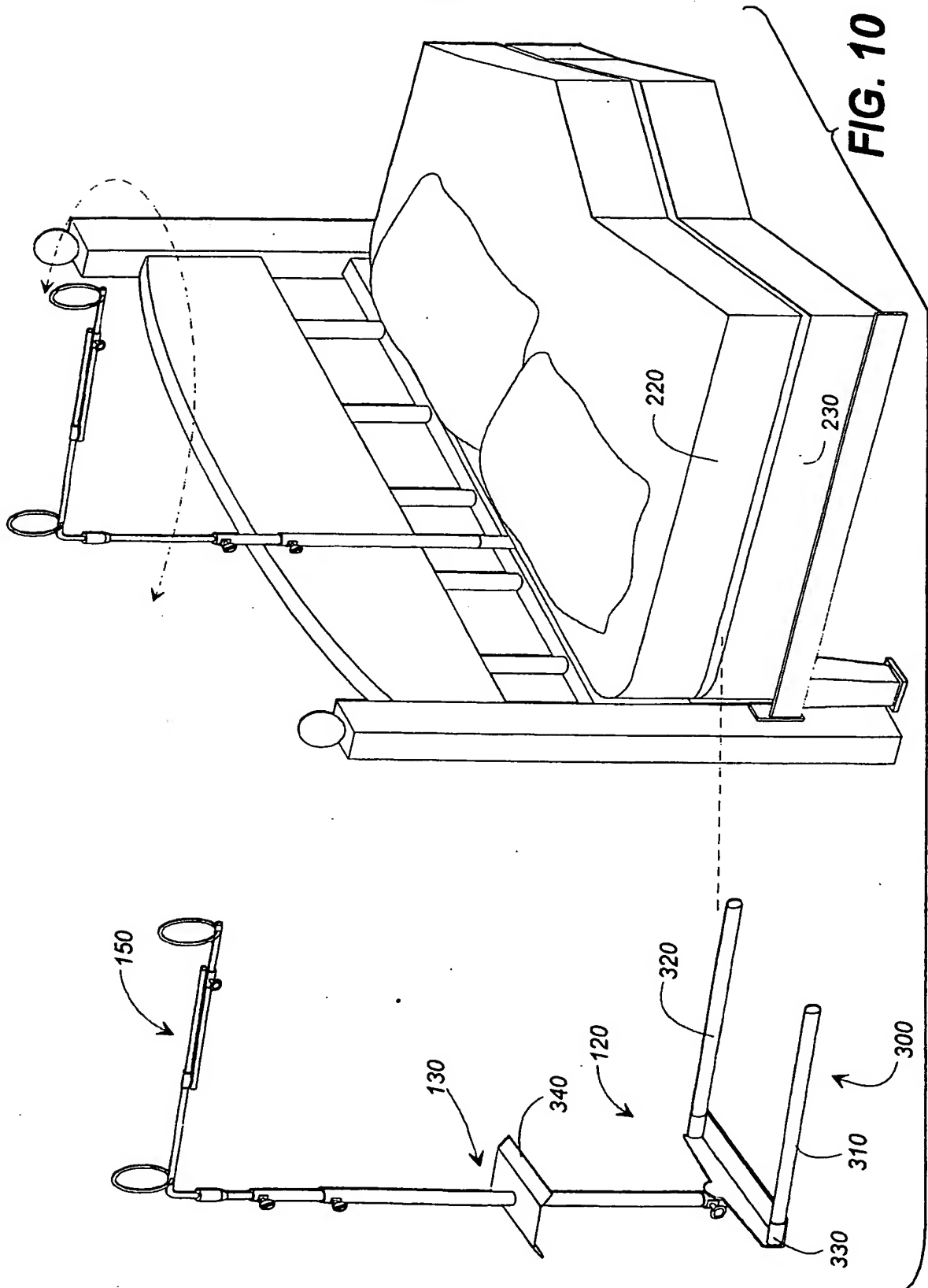
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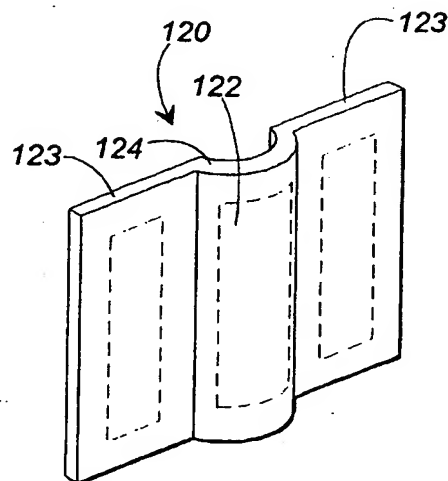
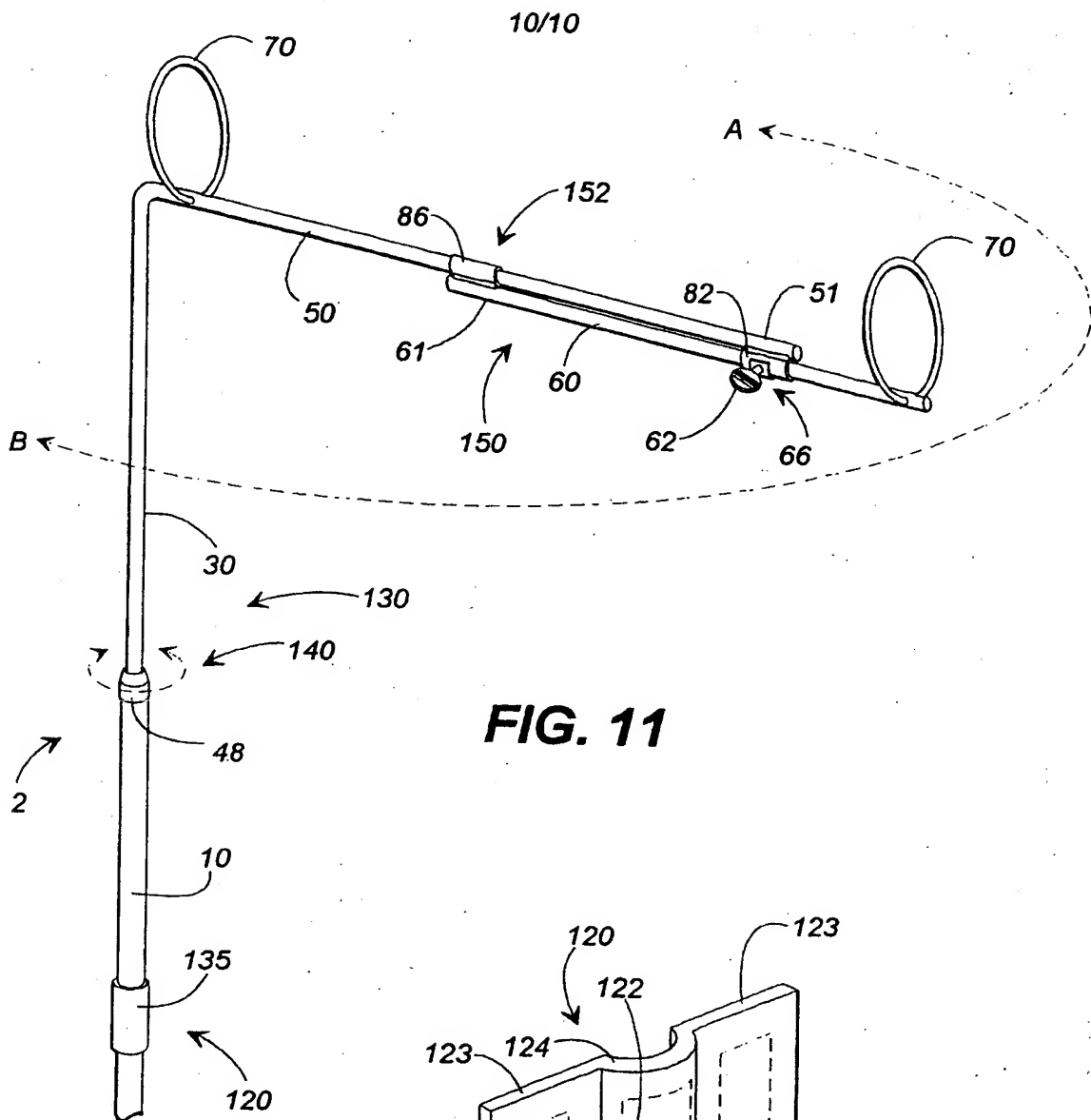


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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/25482

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : A47B 96/06; A47F 1/10, 5/00; A47G 29/00

US CL : 248/205.1, 298.1, 124.1, 122.1

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2,963,247 A (COLLIER et al.) 06 December 1960 (06/12/60), see entire document.	1-2
X	US 5,279,486 A (HARMON) 18 January 1994 (18/1/94), see entire document.	1-2
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Y		3-12
X	US 2,470,694 A (FOO) 17 May 1949 (17/05/49), see entire document.	1-2
Y	US 2,283,324 A (FABER) 19 May 1942 (12/05/42), see entire document.	3-12
Y	US 3,848,870 A (CRAIG) 19 November 1974 (19/11/74), see entire document.	5-9

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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Date of the actual completion of the international search

09 MARCH 1999

Date of mailing of the international search report

31 MAR 1999

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/25482

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	US 2,479,720 A (BRANDT) 24 August 1949 (24/08/49), see entire document.	10-12

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/25482

B. FIELDS SEARCHED

Minimum documentation searched

Classification System: U.S.

248/205.1, 298.1, 124.1, 122.1, 283.1, 518, 521, 529, 534, 535, 539, 80, 81, 106, 157, 158, 159, 161, 163.1, 165, 440.1, 279.1, 281.11

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